

CLAIMS

1. A method for analysing the functionalities of the heart and of the respiratory system of a patient, comprising:
 - segmenting cyclic heart beating sounds into physically defined classes and independently segmenting cyclic breathing cycle into physiologically defined classes;
 - associating segments of same class of said heart sounds with segments of same class of said breathing sounds, and
 - correlating physical characteristics of said heart sounds of same class with physical characteristics of said breathing sounds of same class.
- 20 2. A method for analyzing the functionality of the heart and the respiratory system as in claim 1, and wherein said cyclic heart beating sounds are synchronized by features of an EKG.
- 25 3. A method for analysing a change in the functionality of the heart and the respiratory system of a patient, comprising:
 - identifying the respiratory activity and cardiac sounds;
 - segmenting said respiratory and said cardiac sounds;

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- classifying said segments of said respiratory and said cardiac sounds;
- extracting features of said classes;
- 5 • comparing the features of said classes, and
- determining the significance of the deviation of a set of said features from a respective set of baseline values .

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4. A method for synchronizing a cardiac assist system , comprising:

- segmenting said respiratory activity and said cardiac sounds;
- 15 • correlating physical characteristics of said heart sounds of same class with physical characteristics of said breathing sounds of same class;
- determining the temporal signal structure of the heart,
- 20 • sending control signal to the cardiac assist system.

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5. A system for monitoring the interrelated functionality of the heart
25 and the respiratory system, comprising:

- means for collecting heart beating sounds;
- means for collecting cyclic sound of the respiratory system, and

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- a means for processing said sounds.

6. A system for monitoring the interrelated functionality of the heart
and the respiratory system as in claim 5 and wherein all sounds are
5 collected by one means.

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